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| APPLICATION NO.   | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.        | CONFIRMATION NO. |
|---|-------------|----------------------|----------------------------|------------------|
| 10/600,391  | 06/20/2003  | Andreas Nickel       | BAYER 10260-WCG            | 8238             |
| 27386   | 7590        | 11/19/2009           |                            |                  |
| GERSTENZANG, WILLIAM C.<br>875 THIRD AVE, 8TH FLOOR<br>NEW YORK, NY 10022 |             |                      | EXAMINER<br>NAGPAUL, JYOTI |                  |
|   |             |                      | ART UNIT                   | PAPER NUMBER     |
|   |             |                      | 1797                       |                  |
|   |             |                      | MAIL DATE                  | DELIVERY MODE    |
|   |             |                      | 11/19/2009                 | PAPER            |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



### **DETAILED ACTION**

Remarks filed on July 9, 2009 have been acknowledged. Claims 2, 4-11, 13-16, and 18-28 are pending. Claims 18-25 and 28 have been withdrawn as drawn to a non-elected invention.

#### ***Response to Amendment***

Rejection of Claims 4-5, 8-11 and 26-27 as being unpatentable over Kalthod (US 5,779,897) in view of McGinnis (US 3690465) and further in view of Prasad (US 5352361) has been maintained in light of applicants' amendments.

Rejection of Claims 2, 6-7 and 12 as being unpatentable over Kalthod (US 5,779,897) in view of McGinnis (US 3690465) and further in view of Prasad (US 5352361) as applied to claim 5 above, and further in view of Taketomo has been maintained in light of applicants' amendments.

Rejection of Claims 13-14 as being unpatentable over Kalthod (US 5,779,897) in view of McGinnis (US 3690465) and further in view of Prasad (US 5352361) as applied to claim 27 above, and further in view of Shay (US 4310607) has been maintained in light of applicants' amendments.

Rejection of Claim 15 as being unpatentable over Kalthod (US 5,779,897) in view of McGinnis (US 3690465) and further in view of Prasad (US 5352361) as applied to claim 27 above, and further in view of Bellhouse (US 6217764) has been maintained in light of applicants' amendments.

Rejection of Claim 16 as being unpatentable over Kalthod (US 5,779,897) in view of McGinnis (US 3690465) and further in view of Prasad (US 5352361) as applied to

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claim 27 above, and further in view of Dobo (US 4268278) has been maintained in light of applicants' amendments.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. **Claims 4-5, 8-11 and 26-27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kalthod (US 5,779,897) in view of McGinnis (US 3690465) and further in view of Garcera (US 4640774).

As for claims 4-5 and 8-11, Kalthod teaches a fluid separation module comprising at least one bundle of ceramic capillaries (27). (See Col. 9, Lines 9-12) The capillaries (27) having an external diameter in the range of 0.3 mm to 10mm and internal diameter in the range of 0.1 mm to 8mm. (See Col. 5, Lines 60-64)

Kalthod fails to teach a distance is established between the capillaries by attaching staggered ceramic film strips to the capillaries while the capillaries are parallel, winding the capillaries into a bundle and joining the ending of the bundle of capillaries in an end plate through which their ending pass at a defined distance from each other. The staggered ceramic film strips define a distance between the individual capillaries in the bundle and also form baffle plates within the bundle.

McGinnis teaches the making of a separation module. McGinnis teaches capillaries (14) that are laid side by side in a spaced apart relationship. The capillaries are wound into a bundle and then joined at the ending of the bundle of capillaries (14) in an end plate/perforated plates (19). (See Figures 1 and 9-11) (See Col. 14, Lines 12-15)

The fabrication of capillary bundles in the method described by McGinnis is conventionally known in the art. Kalthod further discloses introducing the filament in a filament winding machine and then into a mandrel as it is rotated. (See Col. 5, Lines 6-8) Thus it would have been obvious to one having ordinary skill in the art to fabricate

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the device of Kalthod as described in McGinnis to achieve the predictable results of proper alignment of the hollow fibers.

Kalthod and McGinnis both fail to teach attaching staggered ceramic film strips while the capillaries are parallel and further, the staggered ceramic film strips define a distance between the individual capillaries in the bundle and also form baffle plates within the bundle.

Garcera teaches separation module comprising a tape of ceramic paste for holding the filter members (3) so that they don't move under the effect of pressure differences, pressure rises and falls, occasional hammering or shock waves, and also differential thermal expansions. (See Col. 6, Lines 64-66 and Col. 7, Lines 13-26)

It would have been obvious to one having ordinary skill in the art to provide the device of Kalthod in view of McGinnis with staggered ceramic film strips while the capillaries are parallel so that they don't move under the effect of pressure differences, pressure rises and falls, occasional hammering or shock waves, and also differential thermal expansions as disclosed in Garcera.

2. **Claims 2, 6-7 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kalthod (US 5,779,897) in view of McGinnis (US 3690465) and further in view of Garcera (US 4640774) as applied to claim 5 above, and further in view of Taketomo.

Refer above for the teachings of Kalthod, McGinnis and Garcera.

Kalthod, McGinnis and Garcera fail to teach the distance is less than 3 mm.

Taketomo teaches a separation module. The module comprises a sheet/spacers (26) at several points along the length of the capillaries so that the individual capillaries

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are spaced apart by a small distance. (See Figure 10 and Col. 1, Lines 50-55) The module further teaches the bottom of the capillaries is securely embedded in a support/end plate (29) for "close packing" in order to provide a sufficient space between each capillary and thus ensuring a gas passage from the outside to the inside of the capillary. (See Col. 2, Lines 5-20)

It would have been obvious to a person of ordinary skill in the art to provide end plates as disclosed in Taketomo to provide a sufficient space between each capillary and thus ensuring a gas passage from the outside to the inside of the capillary.

3. **Claims 13-14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kalthod (US 5,779,897) in view of McGinnis (US 3690465) and further in view of Garcera (US 4640774) as applied to claim 27 above, and further in view of Shay (US 4310607).

Refer above for the teachings of Kalthod, McGinnis and Garcera.

Kalthod, McGinnis and Garcera fail to teach the housing consists of stainless steel.

Shay teaches a separator bundle comprising a bundle of capillary fibers. Shay further teaches a stainless steel housing (34) that encloses the bundle of capillary fibers.

It would have been obvious to a person of ordinary skill in the art to modify the device of Kalthod in view of McGinnis to provide a stainless steel housing enclosing the bundle in order to use the separator module in a battery cell as disclosed in Shay.

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4. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kalthod (US 5,779,897) in view of McGinnis (US 3690465) and further in view of Garcera (US 4640774) as applied to claim 27 above, and further in view of Bellhouse (US 6217764).

Refer above for the teachings of Kalthod, McGinnis and Garcera.

Kalthod, McGinnis and Garcera fail to teach a ceramic housing.

Bellhouse teaches filtration module. Bellhouse teaches a filter comprising a large number of parallel capillaries in a highly porous block of support material/housing. (See Col. 1, Lines 27-29)

It would have been obvious to a person of ordinary skill in the art to modify the device of Kalthod in view of McGinnis to provide a ceramic housing as disclosed in Bellhouse in order ensure radial mixing and hence optimum filtration.

5. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Kalthod (US 5,779,897) in view of McGinnis (US 3690465) and further in view of Garcera (US 4640774) as applied to claim 27 above, and further in view of Dobo (US 4268278).

Refer above for the teachings of Kalthod, McGinnis and Garcera.

Kalthod, McGinnis and Garcera fail to teach a separation module comprising a catalyst.

Dobo teaches fluid separation module comprising hollow fibers. The separation module further comprising a catalyst. (See Col. 1, Lines 1-65)

It would have been obvious to a person of ordinary skill in the art to modify the device of Kalthod in view of McGinnis to provide a separation module with a catalyst in order to obtain desired reactions and enhance separation as disclosed in Dobo.

***Response to Arguments***

6. Applicant's arguments filed July 9, 2009 have been fully considered but they are not persuasive.

First, Examiner would like to thank applicant for pointing out the correction that is currently set forth in this Office Action Summary with regards to number of pending claims.

In response to applicants arguments with respect to Claims 4-5, 8-11 and 26-27 as being unpatentable over Kalthod (US 5,779,897) in view of McGinnis (US 3690465) and further in view of Garcera (US 4640774):

Applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, applicants argue that McGinnis teaches winding of "endless filaments" and not a "plurality" of ceramic capillaries being wound into a bundle is not met by the McGinnis reference. It is the Examiner's position the primary reference, Kalthod, teaches a plurality of ceramic capillaries wound by a filament winding machine where the fiber is drawn onto a mandrel as it is rotated. Kalthod further teaches the fiber may be wound as a single fiber but typically as a group of several fibers. The **winding** is ended when a **wound**

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package of the required diameter is built up. McGinnis teaches a conventional filament winding machine for the fabrication of capillary bundles and the ability to operate under different operating parameters. Additionally, applicants further allege that if one to apply the method of McGinnis to ceramic capillaries such winding would certainly result in immediate breakage of the ceramic capillaries. It is the examiner's position that Kalthod teaches the method of forming a bundle of ceramic capillaries is by winding the fibers to form the bundle and McGinnis teaches a conventional filament or capillary winding machine under different operating parameters, as also addressed above. It would be obvious to one of ordinary skill in the art to use the method of McGinnis to form the plurality of ceramic capillaries with no immediate breakage of the ceramic capillaries. Additionally, Examiner would like to point out that applicants are claiming an apparatus statutory class of invention and it is the structural limitations of the apparatus which are considered in determining the patentability of the apparatus itself and not the process of making the capillary bundle. Applicants further argue that McGinnis does not teach the use of film strips to permit the shell side fluid to flow between and around the individual capillaries. Examiner agrees. Examiner has relied upon Garcera and not McGinnis for the teaching of staggered ceramic film strips. Garcera teaches using tapes of ceramic material in order to avoid sliding of the fiber. In response to applicant's argument that the ceramic film strips in Garcera are employed to not interconnect the filter members as to applicants invention and can not act as baffle plates, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would

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otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). The ceramic tapes of Garcera do interconnect the hollow fibers and would be obvious to one of ordinary skill in art.

In response to applicants arguments with respect to Claims 2, 6-7 and 12 as being unpatentable over Kalthod (US 5,779,897) in view of McGinnis (US 3690465) and further in view of Garcera (US 4640774) as applied to claim 5 above, and further in view of Taketomo:

The arguments are the same as above.

In response to applicants arguments with respect to Claims 13-14 as being unpatentable over Kalthod (US 5,779,897) in view of McGinnis (US 3690465) and further in view of Garcera (US 4640774) as applied to claim 27 above, and further in view of Shay (US 4310607):

The arguments are the same as above.

In response to applicants arguments with respect to Claim 15 as being unpatentable over Kalthod (US 5,779,897) in view of McGinnis (US 3690465) and further in view of Garcera (US 4640774) as applied to claim 27 above, and further in view of Bellhouse (US 6217764):

The arguments are the same as above.

In response to applicants arguments with respect to Claim 16 as being unpatentable over Kalthod (US 5,779,897) in view of McGinnis (US 3690465) and further in view of Garcera (US 4640774) as applied to claim 27 above, and further in view of Dobo (US 4268278):

The arguments are the same as above.

***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JYOTI NAGPAUL whose telephone number is (571)272-1273. The examiner can normally be reached on Monday thru Friday (10:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jyoti Nagpaul/  
Examiner, Art Unit 1797